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A NATURAL CYPRIPEDIUM HYBRID FROM WISCONSIN

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IN the spring of 1930, Dr. E. P. Andrews of Portage reported to the writer that he had observed cream-colored cypripediums at a station near Swan Lake. They appeared to him to be intermediate between *Cypripedium candidum* and *C. parviflorum* and he thought that they might possibly be hybrids. On June 2, 1931, the writer, accompanied by Dr. Andrews and Mr. Harold Staffeld, visited the locality where these cypripediums had been found.

The locality is adjacent to Swan Lake, about five miles east of Portage, Columbia County, Wisconsin. Swan Lake is but an enlargement of the channel of the upper Fox River. A wide margin of meadow, in many places underlain by marl, borders the lake on the west and east, while the soil of the higher land and ridges is sandy. Here, *Polygala Senega, Tradescantia reflexa, Lupinus perennis, Geum triflorum* and *Phlox pilosa* were observed.

The transitional area between the higher land and the meadow was occupied by *Cypripedium candidum, Hypoxis hirsuta* and *Valeriana edulis*. A short distance in the meadow from the transition zone, *C. parviflorum* grew very abundantly. In the *C. candidum* zone, only an occasional plant with a cream-colored lip was found. In the *C. parviflorum* zone over a hundred plants were found that had white or cream-colored lips, madder-purple petals and sepals, and spotted triangular staminodia. In the *C. parviflorum* zone there were at least three thousand typical *C. parviflorum* plants, a hundred or more plants that were intermediate and less than twenty-five typical *C. candidum* plants. The intermediate plants appeared to the writer to be hybrids.

We know that hybridization is of common occurrence in a number of plant families, and a large number of artificial or horticultural orchid hybrids are known. In Europe many natural hybrids have been described, many of which belong to the genera *Ophrys* and *Orchis*. In Europe, the habitats of the various species of orchids have not been so ruthlessly destroyed and consequently there has been an abundance of material for study. In this country, particularly where dairy farming is practiced intensively, it is a difficult matter to find undisturbed habitats which are suitable for the various species, hence the paucity of living orchid material for critical study. It is difficult, and in many cases, impossible to detect hybrids in herbarium material.

Four natural hybrids are listed in Professor Ames's Enumeration.[1] They are: × *Habenaria Andrewsii* (*H. lacera* × *H. psycodes*), × *Habenaria Canbyi* (*H. blephariglottis* × *H. cristata*), × *Habenaria Chapmanii* (*H. ciliaris* × *H. cristata*), and × *Spiranthes vernalis* (*S. cernua* × *S. gracilis*).

In regard to natural orchid hybrids, Professor Ames writes:[2] "Natural hybrids do not seem common among New England orchids, but intensive study may bring more to light. Often the characters which designate hybridity are extremely elusive, and hybrids are classed arbitrarily with the species to which they bear the closest resemblance. As a general rule orchids which hybridize freely give rise to progeny of an intermediate character, but when specific lines are closely drawn, and based on traits phylogenetically young, parental differences may not stand out with sufficient distinctness to attract special attention and so hybrids may well be overlooked."

All of the conditions which are necessary for hybridization appear to have been present at the Swan Lake locality. The two species, *C. candidum* and *C. parviflorum*, grow near each other in an open meadow, blooming at the same time. The numerous plants with intermediate characteristics give unmistakable evidence of being hybrids. The flowers of the two species are quite similar as far as shape and size are concerned and the position and shape of the stigma and anthers are also similar. As it was cloudy and even raining during the time of our visit no observations were made as to the abundance of bees which are instrumental in the transfer of pollen. It might be well to mention that *C. parviflorum* has a much stronger fragrance than *C. candidum* while the hybrid has a fragrance perhaps even stronger than in *C. parviflorum.*

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[1] Ames, Oakes, "An Enumeration of the Orchids of the United States and Canada." American Orchid Society, Boston, Mass., 1924.

[2] Ames, Oakes, "Hybrids in Spiranthes and Habenaria," RHODORA, Vol. 5, p. 264. 1903.

In Wisconsin, *C. parviflorum* has the following characteristics: plants 19–40 cm. high, 1–2 flowered; sepals and petals madder-purple; sepals ovate-lanceolate, 26–35 mm. long; petals lanceolate, 35–45 mm. long; lip orange-yellow, 20–27 mm. long, conspicuously striped on the interior with madder-purple lines, frequently with prominent splashes of madder-purple near the orifice; staminodium (Figure 1) triangular, often semi-cordate at base, 5 mm. wide, 8 mm. long, bright orange-yellow, often spotted with madder-purple near the apex; stigma roundish, 3 mm. wide, 5 mm. long.

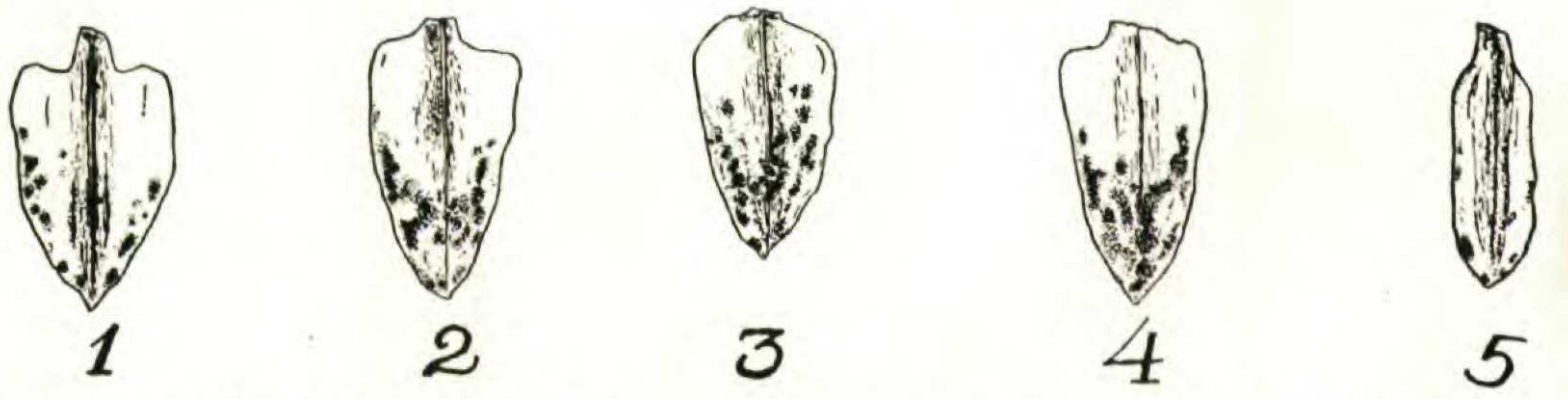
C. parviflorum is found in meadows, bogs and thickets bordering bogs. In some places it occurs in abundance in eastern and northern Wisconsin. This species appears to be absent from the southwestern and western counties as far north as St. Croix County.

C. candidum in this region has the following characteristics: plants 16–28 cm. high, 1-flowered; sepals and petals greenish-yellow, usually striped with lines of madder-purple; sepals ovate to ovate-lanceolate, 24–30 mm. long; petals lanceolate, 25–35 mm. long; lip white, about 22 mm. long, striped on the interior with violet-purple lines; staminodium (Figure 5) oblong-linear, 3.5 mm. wide, 8 mm. long, orange-yellow, unspotted or sparingly spotted with madder-purple; stigma roundish, 3 mm. wide, 4 mm. long.

C. candidum in Wisconsin is found only in the southern counties where it grows in meadows and is frequently associated with *Valeriana edulis* and *Hypoxis hirsuta.* Fifty years ago this species grew in great abundance in numerous localities in southern Wisconsin. Today, most of these meadows are closely grazed or have been plowed and have given place to fields of cabbages, celery and onions. As far as the writer is aware, there are left at the present time in southern Wisconsin only four localities where this species occurs in any abundance at all. In each of these localities *C. parviflorum* grows either with *C. candidum* or in areas not far away. Both species appear to have a preference for neutral or alkaline soil (pH 7–8).

In reference to the occurrence of this hybrid elsewhere in Wisconsin, Mr. S. C. Wadmond of Delavan, Wisconsin writes: "On a visit to Mr. S. W. Faville, Lake Mills, Jefferson County, Wisconsin, May 31, 1931, Mr. Faville took us out into his wild flower garden and showed us a cypripedium which was then in bud and which in both its foliage and floral characters was very suggestive of *parviflorum* but the lip instead of a golden yellow was a pale or lemon yellow and dried out in press a creamy white, very much the same as *candidum* looks in the herbarium. We went out to the low peaty meadow from which this plant had come and we found very much the same conditions existing that you describe at Swan Lake. This meadow is being drained and the cypripediums were having a hard time of it but in years gone by there was an adundance of both species in proximity and probably blooming at about the same time, just as you found them at Swan Lake. Mr. Faville was inclined to favor the theory of hybridity. I was a bit skeptical and never having read of any hybrids amongst our native cypripediums, I was inclined to call it simply a color variant. On looking at the two plants in the herbarium I am entirely convinced that they are the new hybrid." On June 4, 1931, the writer also visited Mr. Faville's wild flower garden. The clump of cypripediums to which Mr. Wadmond referred, was in full flower. They were intermediate forms and were similar to plants observed and collected at Swan Lake.

It is very likely that wherever *C. candidum* and *C. parviflorum* grow in the same vicinity, hybrids will be found. Since Dr. E. P. Andrews of Portage appears to have been the first person to call attention to this hybrid, it is fitting that it should bear his name.



Staminodia (× 2) of 1, CYPRIPEDIUM PARVIFLORUM from Polk County, Wisconsin, *M. P. M.* Cat. no. 70788; 2, 3, 4, × C. ANDREWSII from Swan Lake, Columbia County, Wisconsin, *M. P. M.* Cat. no. 70803; 5, C. CANDIDUM, from Swan Lake, *M. P. M.* Cat. no. 70801.

× CYPRIPEDIUM **Andrewsii**, hyb. nov. (*C. candidum* × *C. parviflorum*). Planta 16–40 cm. alta, 1–2-flora; foliis ovato-lanceolatis, acutis; sepalis petalisque subviridibus, valde colore fusco-purpureo suffusis; sepalis ovato-lanceolatis, 25–37 mm. longis; petalis lanceolatis, 30–40 mm. longis; labello 20–25 mm. longo, albo vel gilvo, intus manifeste violaceo-striato; staminodio 4 mm. lato, 9 mm. longo, aurantiaco, triangulare vel semitriangulare, parte apicali insigniter maculis varisque fusco-purpureis ornato; stigmate subrotundo.

× CYPRIPEDIUM **Andrewsii**, hyb. nov. (*C. candidum* × *C. parviflorum*). Plants 16–40 cm. tall, 1–2 flowered; leaves oval-lanceolate, acute; sepals and petals greenish, much suffused with madder-purple; sepals ovate-lanceolate, 25–37 mm. long; petals lanceolate, 30–40 mm. long; lip 20–25 mm. long, white to cream-colored, conspicuously striped on the interior with violet; staminodium orange-yellow, triangular to semi-triangular (Figures 2, 3 & 4), 4 mm. wide and 9 mm. long, marked in the apical region with spots and blotches of purple-brown; stigma roundish. Type sheet in the herbarium of the Milwaukee Public Museum, Cat. No. 70803, sheet I. June 2, 1931, Swan Lake, Columbia County, Wisconsin. Collected by A. M. Fuller and Harold Staffeld. A co-type specimen and an autochrome photograph have been deposited in the Gray Herbarium.

Mr. Stephen Kliman of the Milwaukee Public Museum made the drawings and supplied the Latin diagnosis. The writer is also indebted to Dr. N. C. Fassett, Mr. S. C. Wadmond, Dr. Ira Edwards and Mr. Gerald Teyen for looking over the manuscript.

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BOTANICAL EVIDENCE OF A POST-PLEISTOCENE MARINE CONNECTION BETWEEN HUDSON BAY AND THE ST. LAWRENCE BASIN

DAVID POTTER

(*Continued from p. 89*)

MARINE SUBMERGENCE IN THE HUDSON BAY REGION

Bell, Low, Wilson, Tyrell and others have conclusively proven that a post-glacial submergence occurred in the Hudson Bay region, which covered a vast territory to the east, west, and south. This area is covered by a mantle of marine clays containing many fossils which are identical with those reported from the St. Lawrence Basin.

TABLE 3 gives a list of some of the localities where these marine fossils have been found. The stations of TABLE 3 have been plotted on the accompanying large map and are indicated by solid black circles. Based upon the known fossiliferous areas, the extent of the marine invasion from James Bay has been shown to reach nearly to that of the St. Lawrence Basin. The area indicated is probably not